

**WHAT IS CLAIMED IS:**

- 1 1. A method comprising:
  - 2 a) accepting search query information including a word;
  - 3 b) determining one or more words related to the word included in the
  - 4 accepted search query, wherein at least one of the one or more words
  - 5 determined has a different root than the word;
  - 6 c) generating an ad request including
    - 7 i) the word included in the accepted search query, and
    - 8 ii) the one or more words determined to be related to the word
    - 9 included in the accepted search query; and
  - 10 d) retrieving ads using the ad request.
- 1 2. The method of claim 1 wherein the act of determining one or more words  
2 related to the words included in the accepted search query includes using  
3 word-related word mapping information, and  
4 wherein the word-related word mapping information is based on query  
5 session word co-occurrence information.
- 1 3. The method of claim 2 wherein the word-related word mapping information  
2 includes weights.
- 1 4. The method of claim 3 wherein the each of the weights are determined using  
2 a probability that a word and a related word will co-occur in a given query  
3 session.
- 1 5. The method of claim 1 wherein each ad includes keyword targeting criteria,  
2 and wherein the act of retrieving ads compares elements of the item request with  
3 keyword targeting criteria with at least some of the ads.
- 1 6. The method of claim 1 wherein the words include one or more of single  
2 words, word segments, phrases, and n-grams.

1 7. A method comprising:

- 2 a) accepting search query information including a word;
- 3 b) determining one or more words related to the word included in the
- 4 accepted search query;
- 5 c) generating an item request including
  - 6 i) the word included in the accepted search query, and
  - 7 ii) the one or more words determined to be related to the word
  - 8 included in the accepted search query;
- 9 d) retrieving items using the item request;
- 10 e) determining a score for each of the retrieved items; and
- 11 f) adjusting the scores of any items retrieved on the basis of the one or
- 12 more words determined to be related to the word included in the accepted
- 13 search query relative to any items retrieved on the basis of the word
- 14 included in the accepted search query.

1 8. The method of claim 7 wherein the act of adjusting the scores includes  
2 decreasing the scores.

1 9. The method of claim 7 wherein the act of adjusting the scores includes  
2 multiplying each of the scores by a multiplier that is less than one.

1 10. The method of claim 9 further comprising:

- 2 g) updating the multiplier using performance information.

1 11. The method of claim 10 wherein the items are ads.

1 12. The method of claim 11 wherein the performance information includes ad  
2 selection information.

1 13. The method of claim 11 wherein the performance information includes ad  
2 conversion information.

1 14. The method of claim 10 wherein the act of updating the multiplier is  
2 performed using a function that causes the updated multiplier to converge to  
3 observed user behavior relevant to performance divided by predicted user  
4 behavior relevant to performance.

1 15. The method of claim 10 wherein the act of updating the multiplier is  
2 performed using the formula:

3 
$$updated\_multiplier = \frac{N \bullet initial\_multiplier + observed\_user\_behavior}{N + naively\_predicted\_user\_behavior}$$

4 wherein N is a number.

1 16. The method of claim 15 wherein the user behavior is selection.

1 17. The method of claim 15 wherein the user behavior is conversion.

1 18. The method of claim 7 wherein the retrieved items are advertisements and  
2 wherein the act of determining a score for each of the retrieved items uses at  
3 least one of ad performance information and ad price information.

1 19. A method comprising:

- 2 a) accepting search query information including a word;  
3 b) determining one or more words related to the word included in the  
4 accepted search query;  
5 c) generating an item request including  
6 i) the word included in the accepted search query, and  
7 ii) the one or more words determined to be related to the word  
8 included in the accepted search query;  
9 d) retrieving items using the item request;

10 e) determining a score for each of the retrieved items; and  
11 f) adjusting the scores of any items retrieved solely on the basis of the  
12 one or more words determined to be related to the word included in the  
13 accepted search query relative to any items retrieved on the basis of the  
14 word included in the accepted search query.

1 20. The method of claim 19 wherein the act of adjusting the scores includes  
2 decreasing the scores.

1 21. The method of claim 19 wherein the act of adjusting the scores includes  
2 multiplying each of the scores by a multiplier that is less than one.

1 22. The method of claim 21 further comprising:  
2 g) updating the multiplier using performance information.

1 23. The method of claim 22 wherein the items are ads.

1 24. The method of claim 23 wherein the performance information includes ad  
2 selection information.

1 25. The method of claim 23 wherein the performance information includes ad  
2 conversion information.

1 26. The method of claim 22 wherein the act of updating the multiplier is  
2 performed using a function that causes the updated multiplier to converge to  
3 observed user behavior relevant to performance divided by predicted user  
4 behavior relevant to performance.

1 27. The method of claim 22 wherein the act of updating the multiplier is  
2 performed using the formula:

3                    
$$updated\_multiplier = \frac{N \bullet initial\_multiplier + observed\_user\_behavior}{N + predicted\_user\_behavior}$$

4    wherein N is a number.

1    28. The method of claim 27 wherein the user behavior is selection.

1    29. The method of claim 27 wherein the user behavior is conversion.

1    30. The method of claim 19 wherein the retrieved items are advertisements and  
2    wherein the act of determining a score for each of the retrieved items uses at  
3    least one of ad performance information and ad price information.

1    31. A method comprising:

- 2            a) accepting search query information including a word;  
3            b) determining one or more words related to the word included in the  
4            accepted search query;  
5            c) generating an item request including  
6                i) the word included in the accepted search query, and  
7                ii) the one or more words determined to be related to the word  
8                included in the accepted search query;  
9            d) retrieving items using the item request;

10          wherein the act of determining one or more words related to words  
11    included in the accepted search query includes using query session word  
12    co-occurrence information.

1    32. A method comprising:

- 2            a) accepting search query information including a word;  
3            b) determining one or more words related to the word included in the  
4            accepted search query;  
5            c) generating an item request including  
6                i) the word included in the accepted search query, and

7                   ii) the one or more words determined to be related to the word  
8                   included in the accepted search query;  
9                   d) retrieving items using the item request; and  
10                  e) determining a score for each of the retrieved items, wherein a score  
11                  component is adjusted for any items retrieved on the basis of the one or  
12                  more words determined to be related to the word included in the accepted  
13                  search query relative to any items retrieved on the basis of the word  
14                  included in the accepted search query.

1   33. The method of claim 32 wherein the act of adjusting the score component  
2   includes decreasing the score component.

1   34. The method of claim 32 wherein the act of adjusting the score component  
2   includes multiplying the score component by a multiplier that is less than one.

1   35. The method of claim 34 further comprising:  
2                  f) updating the multiplier using performance information.

1   36. The method of claim 35 wherein the items are ads.

1   37. The method of claim 36 wherein the performance information includes ad  
2   selection information.

1   38. The method of claim 36 wherein the performance information includes ad  
2   conversion information.

1   39. The method of claim 35 wherein the act of updating the multiplier is  
2   performed using a function that causes the updated multiplier to converge to  
3   observed user behavior relevant to performance divided by predicted user  
4   behavior relevant to performance.

- 1 40. The method of claim 35 wherein the act of updating the multiplier is  
2 performed using the formula:

3 
$$updated\_multiplier = \frac{N \bullet initial\_multiplier + observed\_user\_behavior}{N + naively\_predicted\_user\_behavior}$$

- 4 wherein N is a number.

- 1 41. The method of claim 40 wherein the user behavior is selection.

- 1 42. The method of claim 40 wherein the user behavior is conversion.

- 1 43. The method of claim 32 wherein the retrieved items are advertisements and  
2 wherein the score component is at least one of ad performance information and  
3 ad price information.

- 1 44. A computer-readable medium having stored thereon a computer-readable  
2 data structure comprising a number of entries, each entry including:  
3 a) a first word;  
4 b) a second word determined to be related to the first word on the basis of  
5 query session information.

- 1 45. The computer-readable medium of claim 44 wherein each entry further  
2 includes:  
3 c) a weight indicating a degree of relatedness of the second word to the  
4 first word.

- 1 46. The computer-readable medium of claim 45 wherein the weight corresponds  
2 to a probability that the second word co-occurs with the first word in a query  
3 session.

- 1 47. Apparatus comprising:  
2 a) an input for accepting search query information including a word;

- 3           b) means for determining one or more words related to the word included
- 4           in the accepted search query, wherein at least one of the one or more
- 5           words determined has a different root than the word;
- 6           c) means for generating an ad request including
- 7                 i) the word included in the accepted search query, and
- 8                 ii) the one or more words determined to be related to the word
- 9                 included in the accepted search query; and
- 10          d) means for retrieving ads using the ad request.

1   48. The apparatus of claim 47 wherein the means for determining one or more  
2   words related to the words included in the accepted search query use  
3   word-related word mapping information, and  
4         wherein the word-related word mapping information is based on query  
5   session word co-occurrence information.

1   49. The apparatus of claim 48 wherein the word-related word mapping  
2   information includes weights.

1   50. The apparatus of claim 49 wherein the each of the weights are determined  
2   using a probability that a word and a related word will co-occur in a given query  
3   session.

1   51. The apparatus of claim 47 wherein each ad includes keyword targeting  
2   criteria, and wherein the means for retrieving ads include means for comparing  
3   elements of the item request with keyword targeting criteria with at least some of  
4   the ads.

1   52. The apparatus of claim 47 wherein the words include one or more of single  
2   words, word segments, phrases, and n-grams.

1   53. Apparatus comprising:



- 2 a) an input for accepting search query information including a word;
- 3 b) means for determining one or more words related to the word included
- 4 in the accepted search query;
- 5 c) means for generating an item request including
- 6 i) the word included in the accepted search query, and
- 7 ii) the one or more words determined to be related to the word
- 8 included in the accepted search query;
- 9 d) means for retrieving items using the item request;
- 10 e) means for determining a score for each of the retrieved items; and
- 11 f) means for adjusting the scores of any items retrieved on the basis of
- 12 the one or more words determined to be related to the word included in
- 13 the accepted search query relative to any items retrieved on the basis of
- 14 the word included in the accepted search query.

- 1 54. The apparatus of claim 53 wherein the means for adjusting use a multiplier,
- 2 the apparatus further comprising:
- 3 g) means for updating the multiplier using performance information.

- 1 55. The apparatus of claim 54 wherein the items are ads.

- 1 56. The apparatus of claim 55 wherein the performance information includes ad
- 2 selection information.

- 1 57. The apparatus of claim 55 wherein the performance information includes ad
- 2 conversion information.

- 1 58. The apparatus of claim 54 wherein the means for updating the multiplier use
- 2 a function that causes the updated multiplier to converge to observed user
- 3 behavior relevant to performance divided by predicted user behavior relevant to
- 4 performance.

59. The apparatus of claim 54 wherein the means for updating the multiplier use the formula:

$$\text{updated\_multiplier} = \frac{N \bullet \text{initial\_multiplier} + \text{observed\_user\_behavior}}{N + \text{naively\_predicted\_user\_behavior}}$$

wherein N is a number.

60. The apparatus of claim 59 wherein the user behavior is selection.

61. The apparatus of claim 59 wherein the user behavior is conversion.

62. The apparatus of claim 53 wherein the retrieved items are advertisements and wherein the means for determining a score for each of the retrieved items use at least one of ad performance information and ad price information.

63. Apparatus comprising:

- a) an input for accepting search query information including a word;
- b) means for determining one or more words related to the word included in the accepted search query;
- c) means for generating an item request including
  - i) the word included in the accepted search query, and
  - ii) the one or more words determined to be related to the word included in the accepted search query;
- d) means for retrieving items using the item request;
- e) means for determining a score for each of the retrieved items; and
- f) means for adjusting the scores of any items retrieved solely on the basis of the one or more words determined to be related to the word included in the accepted search query relative to any items retrieved on the basis of the word included in the accepted search query.

64. The apparatus of claim 63 wherein the means for adjusting uses a multiplier, the apparatus further comprising:

3 g) means for updating the multiplier using performance information.

1 65. The apparatus of claim 64 wherein the items are ads.

1 66. The apparatus of claim 65 wherein the performance information includes ad  
2 selection information.

1 67. The apparatus of claim 65 wherein the performance information includes ad  
2 conversion information.

1 68. The apparatus of claim 64 wherein the means for updating the multiplier use  
2 a function that causes the updated multiplier to converge to observed user  
3 behavior relevant to performance divided by predicted user behavior relevant to  
4 performance.

1 69. The apparatus of claim 64 wherein the means for updating the multiplier use  
2 the formula:

3 
$$updated\_multiplier = \frac{N \bullet initial\_multiplier + observed\_user\_behavior}{N + predicted\_user\_behavior}$$

4 wherein N is a number.

1 70. The apparatus of claim 69 wherein the user behavior is selection.

1 71. The apparatus of claim 69 wherein the user behavior is conversion.

1 72. The apparatus of claim 63 wherein the retrieved items are advertisements  
2 and wherein the means for determining a score for each of the retrieved items  
3 uses at least one of ad performance information and ad price information.

1 73. Apparatus comprising:

2 a) an input for accepting search query information including a word;

3           b) means for determining one or more words related to the word included  
4           in the accepted search query;  
5           c) means for generating an item request including  
6                i) the word included in the accepted search query, and  
7                ii) the one or more words determined to be related to the word  
8           included in the accepted search query; and  
9           d) means for retrieving items using the item request;  
10          wherein the means for determining one or more words related to words  
11          included in the accepted search query use query session word co-occurrence  
12          information.

1   74. Apparatus comprising:

2           a) an input for accepting search query information including a word;  
3           b) means for determining one or more words related to the word included  
4           in the accepted search query;  
5           c) means for generating an item request including  
6                i) the word included in the accepted search query, and  
7                ii) the one or more words determined to be related to the word  
8           included in the accepted search query;  
9           d) means for retrieving items using the item request; and  
10          e) means for determining a score for each of the retrieved items, wherein  
11          a score component is adjusted for any items retrieved on the basis of the  
12          one or more words determined to be related to the word included in the  
13          accepted search query relative to any items retrieved on the basis of the  
14          word included in the accepted search query.

1   75. The apparatus of claim 74 wherein the score component is adjusted using a  
2   multiplier, the apparatus further comprising:

3           f) means for updating the multiplier using performance information.

1   76. The apparatus of claim 75 wherein the items are ads.

1 77. The apparatus of claim 76 wherein the performance information includes ad  
2 selection information.

1 78. The apparatus of claim 76 wherein the performance information includes ad  
2 conversion information.

1 79. The apparatus of claim 75 wherein the means for updating the multiplier use  
2 a function that causes the updated multiplier to converge to observed user  
3 behavior relevant to performance divided by predicted user behavior relevant to  
4 performance.

1 80. The apparatus of claim 75 wherein the means for updating the multiplier use  
2 the formula:

3 
$$updated\_multiplier = \frac{N \bullet initial\_multiplier + observed\_user\_behavior}{N + naively\_predicted\_user\_behavior}$$

4 wherein N is a number.

1 81. The apparatus of claim 80 wherein the user behavior is selection.

1 82. The apparatus of claim 80 wherein the user behavior is conversion.

1 83. The apparatus of claim 74 wherein the retrieved items are advertisements  
2 and wherein the score component is at least one of ad performance information  
3 and ad price information.